FAA | AVIATION NEWS

OCTOBER 1962

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AIRPORTS FOR TOMORROW

The vitality and rapid growth of general aviation in this country is a phenomenon that continually amazes foreigners who visit general aviation airports around the country.

In fleet size, general aviation outnumbers the airlines 35 to one. It leads in number of hours flown three to one. Active general aviation airplanes in 1961 numbered more than 76,000; their pilots flew some 12,600,000 hours.

Looking to the future, the *Project Horizon* report foresees by 1970 a general aviation fleet of 105,000 aircraft flying 18,500,000 hours.

The FAA is planning for this expansion.

FAA Administrator N. E. Halaby has proposed to the Secretary of Commerce that the Nation's highway program and airport program be combined much more than we ever have before.

Such a program already is underway in Oklahoma where local authorities are building simple airstrips along turnpikes that are under construction as part of an expanded network of roads. By using heavy construction equipment already on the site, coupled with excess material and some workers who are not otherwise engaged, this far-sighted state has already built a number of airstrips.

In Oregon, there are 16 airstrips being built under a similar plan.

As a result, Halaby pointed out, "We will have a large number of general aviation airports over the next number of years—simple, safe, convenient for emergency in case of sickness or flood; convenient for the person who wants to take his family on a week-end trip; convenient for the local community; and important in pulling away some of the general aviation traffic from congested hubs."

If carried out, the benefits of such a grass-roots program could have an enormous effect on civil aviation in the United States.

The FAA and other government agencies can lend assistance. But general aviation itself must take a leading role in developing interest in the program throughout the country.

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***COVER:** On the threshold of the realm of flight, student seeking pilot's license takes flight test with FAA inspector. For the outcome, see page 8.*

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In an environment where machines play an ever-increasing role, the key to safety in the air still rests on good judgment displayed by pilot and controller.

HUMAN FACTOR STILL DOMINANT IN AVIATION TECHNOLOGY

The pilot in the air and the air traffic controller on the ground will retain their key decision-making functions in the airspace utilization system of the future, but will be equipped and supported with machines that perform certain tasks better than man does.

The reason, according to Joseph D. Blatt, Director of FAA's Systems Research and Development Service, is that "Man is slow and sloppy, but a brilliant thinker and decision maker." Machines, he said, "can be . . . very fast and highly accurate, but unfortunately they are stupid."

Speaking last month to doctors attending the ninth annual Postgraduate Course in Aerospace Medicine at Ohio State University, Blatt said that "the pilot and controller of tomorrow will find themselves in an environment in which the machine will play a new and essential role.

"This man-machine relationship," he said, "will necessarily be different from and more intimate than any previous machine utilization. What we are creating today . . . is a man-machine symbiosis which draws on the special abilities of each partner to help provide a new level of safe and efficient airspace utilization."

These conclusions were arrived at by the Project Beacon System Design Team in its recently published proposal for modernizing the nation's air traffic control system (see *FAA Aviation News*, September, 1962.)

Humans in tomorrow's system create a number of engineering problems, including:

1. Selecting, training and evaluating controllers.
2. Improving controllers' gathering and communicating of information.
3. Improving pilots' gathering and communicating of information.
4. Increasing the ability of pilots to observe airport lighting, tall tower obstructions and other aircraft.
5. Improving the skills of pilots and controllers in tomorrow's system.

Human factors and "human engineering" are providing solutions related to the above problems in each of these areas:

1. A battery of very effective aptitude and personality tests to screen student controllers has been developed and is being used in conjunction with a rigid physical exam and intensive training at the FAA Academy.

2. FAA R&D work is pushing ahead rapidly to develop a semi-automatic computerized environment for the controller. The controller's physical environment also is being re-engineered.

3. Studies similar to those of the controller are being programmed for the pilot in actual flight and in simulation. Special purpose studies, such as radio voice communication, are underway. Other studies, ranging from flight and simulator tests of visual guidance from runway lights to the utility of cockpit instruments, are being conducted at FAA's National Aviation Facilities Experimental Center (NAFEC). Studies of stress and fatigue effects on pilots and crews are underway at FAA's medical test facility.

4. A complete set of airport lighting standards is being developed for large and small airport and heliports. Studies of tall tower lighting and marking are nearing completion, as are studies of conspicuity enhancement of aircraft to minimize the threat of collision between VFR and IFR aircraft. This includes aircraft lighting and high-visibility paints.

5. Controllers and pilots of the future will have to upgrade their skills—although this will apply much more directly to the controller, who will have to master new hardware. In the future, greater proficiency may be required of pilots of VFR aircraft at high activity terminal areas and along positively controlled air routes.

Blatt summarized the role of the human in tomorrow's air system by saying: "I find in all this an important reaffirmation of the powers of man in an age when many fear that we are helplessly caught up in a technological juggernaut."

Pilots Encouraged to Try New Weather Avoidance Radar Service

Pilots are invited to sample a weather avoidance radar service now under test evaluation at the Washington, D. C., Flight Service Station.

By either personal visit or radio call to Washington radio (126.7 or 122.2 mc.), pilots can be advised of the location and intensity of weather "echoes" within 100 miles of Washington. These echoes indicate the location, speed and direction of thunderstorms, areas of heavy precipitation and major cloud build-ups. Echo information should enable pilots to select the best route to avoid undesirable weather in much the same manner as aircraft equipped with airborne weather radar.

There is a weather radarscope installed at the Washington Flight Service Station briefing counter for direct viewing by pilots visiting the station.

Flight Service Stations at New York, Philadelphia, Millville, N. J., Salisbury, Md., Harrisburg, Pa., and Newport News, Va., have direct interphone connection with the Washington Flight Service Station. The stations will obtain weather radar information upon requests from pilots.

Replacing Medical Certificates

With most of the Washington operations of the Aviation Medical Service transferred to Oklahoma City, correspondence concerning lost medical certificates should be addressed to:

Aeromedical Certification Division
Aviation Medical Service
Federal Aviation Agency
P. O. Box 1082
Oklahoma City, Okla.

Free Inspection Sticker Offered As Safety Hint to Plane Owners

Free inspection tags are being offered to all aircraft owners by FAA to help remind them of the date of their next periodic inspection.

The tag is a silver-colored plastic tape overprinted in blue and bears the FAA seal. Each is three inches square and closely resembles an automobile inspection sticker.

Use of the tags is not mandatory, but FAA Administrator N. E. Halaby urges all pilot-owners in general aviation to take advantage of the new service.

"Failure to comply with the section concerning periodic inspection of aircraft is one of the most frequent violations of the Civil Air Regulations," Halaby noted. "But most of these violations are unintentional, resulting from memory lapses on the part of aircraft owners. We believe widespread use of the tags will help in solving this problem."

The tags may be obtained from any FAA inspector. He will examine the aircraft log books to determine the date of the next periodic inspection and perforate the tag accordingly.

Authorized inspectors, airframe repair stations and manufacturers also may issue the tags if they desire to participate in the program. Renewals may be obtained at the time of the periodic inspection. Replacements for lost or mutilated tags may be acquired in the same manner as original ones.

AGENCY TO CHECK USAF NAVAIDS

The job of flight checking the Air Force's world-wide system of more than 1,600 air navigation aids is being assumed by FAA under an agreement with the Air Force.

The flight inspection program began in Alaska last month. It will be extended to the southern and southwestern United States this month and over the entire nation on January 1, 1963. Europe and the Middle East will be included on April 1 and the Far East on June 1, 1963.

To assist in the program, the Air Force will transfer to FAA 16 airplanes which are specially equipped for flight checking navaids.

Included are 10 T-29s (military version of the Convair 240) and six C-54s (military version of the DC-4).

In addition, the Air Force will lend approximately 100 men to FAA during the nine-month phase-in period. They will help man the transferred aircraft while the FAA is recruiting and training civilian flight crews.

PUBLICATIONS AVAILABLE

Pilot's Radio Handbook—75¢.

New Federal Aviation Regulations: Part 141, Pilot Schools—25¢; Part 143, Ground Instructors—15¢; Part 145, Repair Stations—30¢; Part 147, Mechanic Schools—20¢; Part 149, Parachute Lofts—20¢.

Summary Version of the Design for the National Airspace Utilization System —45¢.

Order from:

Superintendent of Documents
Government Printing Office
Washington 25, D. C.

Airport Surface Bottlenecks Are Cause of Terminal Area Delays

Preliminary analysis of a Federal Aviation Agency questionnaire indicates that most terminal area delays are due to airport surface problems.

Some of the bottlenecks found to delay departures in busy terminals are insufficient or inadequate taxiway layouts, warm-up pads, high speed turn-offs, and ramp, gate and parking facilities.

At the busier airports during congested periods, there are more air carrier aircraft on the airport than can be handled by available gate space.

The survey is part of a continuing FAA-industry effort to seek out all causes of terminal area delays. It is based on a comprehensive questionnaire submitted to some 265 towers for reply. With practically all returns in, FAA's Air Traffic Service is now finishing up its evaluation of the questionnaire data.

In an earlier study (*FAA Aviation News*, July, 1962), the air traffic control delay estimate was based on elapsed time between the proposed time of take-off as indicated in the pilot's flight plan and the actual time of take-off. The current questionnaire, on the other hand, considers delay time from the time the pilot asks for taxi instructions until the time he receives a take-off clearance.

The previous study was based on an analysis of IFR peak day data and flight plan information filed by Centers and towers. Although unsubstantiated, air traffic control was estimated as contributing approximately 10 percent of the $363.8 million of annual excessive terminal delay costs due to all causes at civil and military airports. Excessive delay is defined as more than five minutes delay —considered a nominal operational contingency delay.

The $363.8 million cost figure was derived by converting IFR peak day elapsed time—the difference between requested or scheduled departures and actual time off—to estimated annual hours of total elapsed time.

The initial study verified that the greatest delay problems were concentrated in a relatively few high-density locations, but did not identify the causes of delays. The follow-up questionnaire will fill in this gap by obtaining information on the adequacy of the airport's capacity to handle the IFR and VFR traffic during busy and normal hours, and the primary and secondary reasons for delays.

Further analysis of this study is planned for the near future.

TEST YOUR AERONAUTICAL KNOWLEDGE: AIRSPEED INDICATOR

From time to time, FAA Aviation News *will print brief quizzes, similar to the one below, for pilots who want to brush-up on their aeronautical knowledge.*

The airspeed indicator above depicts the airspeed limitation markings of a late model civil airplane. How many questions can you answer by studying the airspeed indicator pictured? Answers, and an explanation of the standard markings, are given at the bottom of the page.

1. What is the flap operating range?
2. What is the power-off stalling speed with the wing flaps and landing gear in the landing position?
3. What is the maximum flaps extended speed?
4. What is the normal operating range?
5. What is the power-off stalling speed "clean"—gear and flaps retracted?
6. What is the maximum structural cruising speed?
7. What is the caution range?
8. What is the never exceed speed?

ANSWERS

Airplanes manufactured after 1945 and certificated under the provisions of CAR 3 (12,500 lbs. or less) are required to have the standard system of airspeed indicator markings described in this Exam-O-Gram. In the interest of safety, it is important for a pilot to recognize and understand these markings. A short explanation of the airspeeds and airspeed ranges follows. The descriptions are limited to simple layman language. For more technical engineering nomenclature, refer to *Civil Aeronautics Manual 3.*

Starting with lower speeds and working up we have:

1. Flap operating range (the white arc) . . **59 to 110 mph**

2. Power-off stalling speed with the wing flaps and landing gear in the landing position (the lower limit of the white arc) . . . . . **59 mph**

3. Maximum flaps extended speed (the upper limit of the white arc). This is the highest airspeed at which you can put down full flaps. If flaps are operated at higher speeds, severe strain or structural failure may result . . . . **110 mph**

4. The normal operating range (the darker gray arc—green on actual instrument) . . . . . **65 to 175 mph**

5. Power-off stalling speed "clean"—wing flaps and landing gear retracted (the lower limit of the darker gray arc—green on actual instrument) . . . . . **65 mph**

6. Maximum structural cruising speed (the upper limit of the darker gray arc—green on actual instrument) . **175 mph**

7. Caution range (the lighter gray arc—yellow on actual instrument). You should avoid this area unless you are in smooth air . . . . . **175 to 200 mph**

8. Never exceed speed (the radial black line—red on actual instrument). This is the maximum speed at which the airplane can be operated in smooth air. No pilot should ever intentionally exceed this speed . . . . . **200 mph**

There are other airspeed limitations *not marked on the airspeed indicator* which you should know. They are generally found on placards in view of the pilot or in the *Airplane Flight Manual.* One of these speeds, a very important one, is the maneuvering speed. This is your rough air speed and the maximum speed for abrupt maneuvers. If during flight you should encounter severe turbulence, you should reduce your airspeed to maneuvering speed or less in order to reduce the stress upon the airplane structure.

FAA Reports on First Six Months Of New Hearing Officer System

FAA's new Hearing Officer system, now rounding out its first six months of operations, has received requests for formal hearings from 31 airmen faced with suspension or revocation of their certificates for alleged violations of the Civil Air Regulations.

To date, 16 hearings have been completed and decisions reached in 7 cases. Of the 7, two cases were terminated; actions of the Regional Counsels were sustained in three and modified in two. The remaining cases are set for early hearings at locations convenient to the airman's residence.

One of the cases terminated involved a commercial pilot charged with operating a helicopter within a control zone without tower clearance when the ceiling was below minimums for VFR flight. Upon further investigation of evidence the case was dismissed. The second termination concerned a mechanic who failed to complete aircraft records and who certified aircraft as airworthy when in fact they were not. He was permitted to pay a penalty of $150 in lieu of revocation. The certificate of another mechanic faced with a similar violation was suspended for 30 days as proposed by the Regional Counsel.

A private pilot who flew lower than 500 feet over people and residences had his certificate suspended for 60 days rather than the 120 days originally proposed, and the penalty of a student pilot facing a two-year revocation for carrying passengers was reduced to 18 months.

The medical certificate of a pilot who omitted required information on his application for a medical certificate was ordered revoked, a penalty upheld by the Hearing Officer.

The Hearing Officer system replaced FAA's former practice of revoking or suspending certificates on the basis of a reply in writing to the charge, or an informal conference between airmen and FAA enforcement attorneys. An airman now may request either a formal hearing within 15 days after the notice has been issued, or an informal conference with an Agency Counsel. Even though the latter is conducted the airman may still request a formal hearing and submit an answer to the allegations contained in the notice.

If at the conclusion of the formal hearing the airman's certificate is ordered modified, suspended or revoked, the order at the same time advises him of his right of appeal to the Civil Aeronautics Board.

Well Done

Exercise Sky Shield III finished promptly at 8:30 P. M. EDT, and we feel it was highly successful in its training goals. The realism we attained is owed in great measure to the public understanding and tolerance of both Canadians and Americans—airlines, private fliers and plain citizens—who took air travel interruption in good spirits, and contributed to our two-nation security in so doing. Please convey NORAD's appreciation and thanks to them all.

General John K. Gerhart
Commander-In-Chief
No. Amer. Air Defense Command

Operational Tests Planned for Runway Arresting Gear Equipment

FAA test aircraft early this month begin the operational checkout of runway arresting gear equipment designed for modern jet transports.

The Agency's Convair C-131 and Boeing 720 will provide the first "live" testing of the new gear. Both have been fitted with tail hooks and instrumentation to measure test-arrestment results.

The equipment to be tested is the second Model 3500 water-squeezer arresting gear produced under FAA contract by the All American Engineering Company, Wilmington, Del. It was installed last month at FAA's National Aviation Facilities Experimental Center, Atlantic City, N. J. The first piece of equipment underwent "dead load" tests at the Sussex County Airport, Georgetown, Del.

In this test series, heavy loads riding on flat cars were accelerated along a runway and arrested by the gear. Loads up to 350,000 pounds were arrested at speeds up to 130 knots. Also tested in this series, which ended last month, was a tail hook suitable for transport operations.

By mid-November, FAA expects to have proved the feasibility of arresting transport-type aircraft with the equipment under study, which is similar in concept to arresting gear used in aircraft carrier and land-based Air Force and Navy jet fighter operations. The arrestment capacity for transports has to be some six times as great as in the case of fighter planes.

All American Engineering has been conducting arresting gear work under a $1,018,486 FAA contract extending over the past two years.

Drinking While Flying Provides Pilots with Food for Thought

A preliminary review of general aviation accident data provides convincing evidence that an aircraft accident is far more likely to be a fatal one if alcohol is involved.

Although still in an early stage of study, statistics based on all general aviation accidents that occurred between 1957 and 1960 show that in accidents where alcohol was mentioned in the report, the rate of fatal accidents is approximately 42 percent. This is contrasted with a 10 percent fatality figure where alcohol was not mentioned. Stated simply, the likelihood of an aircraft accident being fatal is four to five times greater if alcohol is involved.

Making this data even more thought provoking is the fact that, for the most part, the reports filed by accident investigators did not contain specific tests for blood alcohol. Such tests, if routinely performed, would provide a valuable supplement to the data.

Dr. Homer L. Reighard, Special Assistant for Professional Programs, is in charge of the study.

Comments Sought on Revised Rules for Supplementals

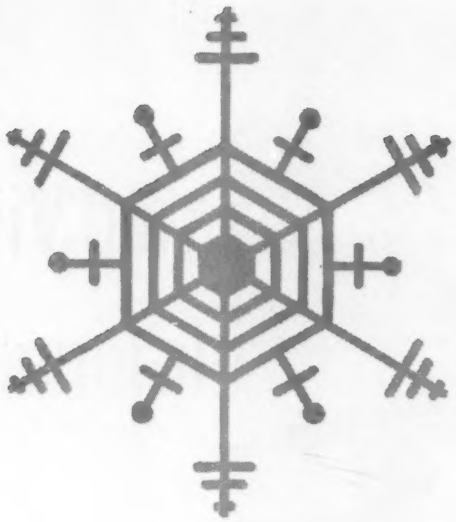
FAA proposes to rewrite the regulations covering supplemental and commercial operators in order to bring the regulations more in line with those applicable to scheduled air carriers.

The proposal reiterates FAA's past position that the same safety standards should apply to both.

Major changes would give FAA authority to

- Examine the financial books of a commercial operator;
- Establish minimum standards for Directors of Operations, Chief Pilots, Directors of Maintenance and Airworthiness and Directors of Quality Control to insure that such personnel possess qualifications commensurate with the responsibilities of their positions;
- Require operators to establish either an approved dispatch system or a flight following service.

Comments on these proposed revisions to Part 42 of the Civil Air Regulations will be accepted through October 23 at the Dockets Section, FAA, Washington 25, D. C.



WINTER FLYING Calls for Special Care

Winter flying is safe if pilots are especially alert to its hazards.

Winter flying need not be especially hazardous if pilots will be extra careful about weather problems in cold climates and pay close attention to winter aircraft precautions.

A VFR pilot should avoid taking chances on the weather. If it is even slightly questionable, he should stay on the ground.

When he does fly, the VFR pilot should file a flight plan and take advantage of preflight and inflight weather briefings and the Flight Following Service. It takes two-way radio to benefit fully from the Service, but pilots with minimum radio gear can pick up weather summaries and special broadcasts. And even with no radio, a pilot can determine weather conditions along his route before taking off.

If he files a flight plan, a pilot without two-way radio can fly with the assurance that a search will be started if he is too long overdue at his destination.

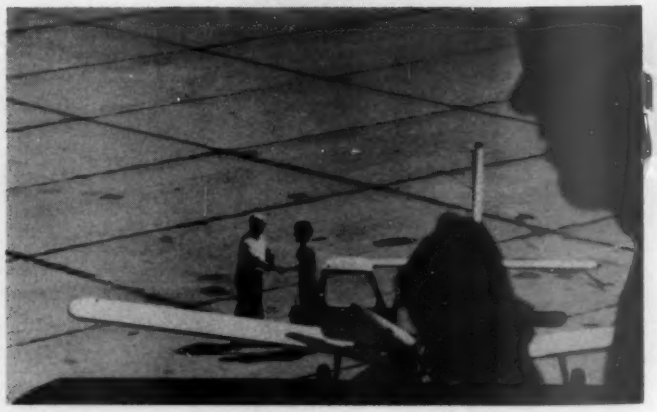
To cope with cold weather mechanical hazards, pilots should study their engine and aircraft handbooks and follow recommended procedures for winter operation. These rules will usually include methods for protecting the crankcase and will note the proper fuel and oil for low temperature conditions.

A few general winter precautions include:

- Be sure the brakes are operating at maximum efficiency.
- Winter days are short. Are the navigation and landing lights in order?
- Do not attempt to takeoff with snow, frost or ice on wings or the control surfaces.
- Guard against condensation. Water in the fuel line can affect the engine operation. Water in the airspeed line, if it freezes, can block the line so that the airspeed indicator, the sensitive altimeter and the vertical speed indicator will give incorrect readings or fail completely.
- Keep gas tanks filled when not flying. This helps prevent condensation. Drain the sediment bowl, where condensation gathers, after every landing and before each takeoff.
- Oil gets sluggish in cold weather and an engine will build up excessive pressure immediately after starting. This sometimes strains the lines and connections between tank and engine. Check them frequently.
- Preheat the engine and oil if the airport provides such service. Never use a blowtorch for this purpose because of the fire hazard.
- As gasoline leaks sometimes occur even in the best of carburetors, snow inside the engine cowling can also be a fire hazard. Always remove it before starting the engine.
- If the aircraft has retractable landing gear, inspect wheel wells before every takeoff and after every landing. After taking off from a snow or slush covered runway, actuate the landing gear a few times to shake loose any moisture that might have been picked up. This prevents freezing of the gear in the well.
- When flying in rain or snow be on guard against runback which can freeze and block the static opening of the airspeed lines. Even when the air is smooth, move the control surfaces occasionally to keep them free.
- Check cabin heaters. Carbon monoxide is an ever-present danger. The smallest amount can affect a pilot's judgment or flying ability. Over a period of several hours it can cause unconsciousness.
- Check the airports, particularly in the snow belt. Find out what the runway conditions are before trying to land. Patches of snow can cause serious trouble. Watch the braking action.

Vitality, V

General aviation of tomorrow begins with the enthusiast of today, whose exuberance is typified by 25-year-old Elaine Smith who came to North Philadelphia Airport last month to take her flight examination. With a veteran FAA Operations Inspector, John McCarthy, conducting the test (above *left and clockwise*), Elaine performed her preflight and got a last minute briefing before taking off. Good training paid. She landed after a one-hour flight, got a congratulatory handshake from McCarthy and beamed as he signed her FAA license with the notation PRIVATE PILOT . . . AIRPLANE SINGLE-ENGINE LAND.



Variety Characterize General Aviation

The vigorous growth of general aviation—largest segment of the nation's aviation industry—is characterized perfectly by bustling North Philadelphia Airport, where traffic has increased 15-fold in the last 15 years.

Built in 1942 of wartime necessity, this city-owned airport has been developed through the years with Federal assistance into a major general aviation airport for an expanding volume of private, business and corporate aircraft along with supplemental air carrier service. It is a field where enthusiastic fledglings find genuine welcome and help.

There are more than a hundred aircraft based at North Philadelphia. Traffic activity has increased from a postwar low of 7,000 operations in 1946 to 111,000 operations in 1961. This year, airport officials expect to reach 120,000 operations.

The Federal Aviation Agency has made available some $250,000 under the Federal Aid Airport Program during the past five years to help develop North Philadelphia. The money, matched by the City of Philadelphia, has provided a number of vital additions to the airport: high intensity runway lighting for the instrument runway, complete taxiway lighting, dual service power system, acquisition of land for clear zone off the approaches of each runway, and removal of obstructions off runway approaches.

More recently, FAA installed an LVOR navaid and replaced the Low Frequency Range Station with a Non-Directional Radio Marker Beacon which reduced landing minimums to 400-1.

Other FAA support and services—some of which are pictured on the next page—are sometimes overlooked. Nevertheless, they are vital to the progress

Sister Veronica, a teacher of Latin at Nazareth Academy for girls, is a newcomer to aviation. Under the tutelage of Jack Welsh, an FAA-certificated Flight Instructor, she hopes to earn a pilot's license and use her new knowledge and skill to prepare her students for the aerospace age by forming a CAP chapter at the Academy. "I find," she says, "that if I can relate my teaching of Latin to aviation and allied fields, the girls are much more interested in the subject." Sister Veronica has pioneered in one respect: She has written a Latin primer using aerospace topics and terms.

and safety of aviation and help in its development.

An important ingredient in the continuing growth of general aviation is the enthusiasm and dedication of airmen and the support rendered by the Federal Aviation Agency.

The FAA touches upon virtually all facets of aviation in carrying out its statutory responsibility: "The promotion, encouragement, and development of civil aeronautics. . . ."

The neophyte learning to fly taps the experience and skill of an instructor who is certificated by the FAA. The veteran at the controls finds knowledgeable people at Flight Service Stations and towers who are ready and able to help.

Because safety is paramount, FAA certificates repair stations and periodically checks their procedures and performance. As a result, aircraft owners can have confidence in their maintenance work.

As an Agency dedicated to serving aviation, FAA looks forward to continued service to those who fly and to general aviation's bright future.

At FAA-approved repair station, skilled technicians repair auto pilot (*top*) and (*above*) adjust gyro compass. *Right,* certificated A & P mechanic performs periodic inspection on an airplane based at North Philadelphia Airport.

Pilot seeking advanced rating for an instrument ticket takes instruction in Link trainer at FAA-approved flying school.

Tower Chief Peter Pellegrino and Airport Superintendent Charles Rogers *(above, left to right)* discuss traffic control procedure. *Right,* traffic controllers maintain proficiency by taking periodic examination. *Below right,* Anne M. Shields, an air traffic control specialist who was a wartime WASP and holds a commercial pilot's license and flight instructor certificate, files pilot radio report in Flight Service Station.

Communications, vital in aviation safety, require exacting maintenance of towers *(left)* and transmitters *(above)*.

Every Day's a Busy One for FAA Manufacturing Inspectors

New airplanes rolling off the production line are products of many hands, designer, engineer, manufacturer—and an FAA inspector (*above*) who literally lives with the aircraft industry.

While all those connected with the industry are vitally concerned with safety, it is FAA's manufacturing inspectors who control final approval of the entire product as well as the components—engine, propeller, even seat belts. These inspectors spend thousands of hours evaluating, checking and inspecting to be sure the airplane meets safety requirements.

Determining adequate quality control is a full-time job for 83 FAA manufacturing inspectors who are responsible for 737 production projects or manufacturing firms and hundreds of suppliers throughout the nation. In addition, these men are responsible for inspecting experimental aircraft, export aircraft and prototypes of aircraft altered by owners or operators.

The manufacturing inspector has three primary program areas—type certification inspection, production certificatation and original airworthiness certification. Issuance of a type certificate means that FAA has approved a product's design, including a prototype of the product. The individual items to be manufactured under this design, however, have not been approved—this comes with the production certificate and the airworthiness certificate.

Before issuance of the type certificate the inspector makes sure that the prototype article conforms to the approved design and that the design lends itself to manufacturing and quality control.

After the manufacturer receives design approval for the engine, propeller or whatever the aircraft component may be, he may obtain a production certificate after the inspector has determined that all production certification standards have been complied with.

One of the inspector's tasks is evaluating and approving quality control data submitted by the manufacturer. The inspector must examine detailed procedures, systems and records of the manufacturer indicating what inspections and tests are to be used on what items. He checks the results of heat treating, welding and other processes and procedures in making the article. The inspector peers into airframes, engines and assemblies to insure that they are being constructed as described in the quality control data and records. He also inspects the manufacturer's methods of receiving and storing raw materials as well as his control over the quality of all items procured from outside suppliers.

After all preliminary inspecting has been done, but before a production certificate is issued, a production certification board convenes at the manufacturer's plant. This board, headed by an FAA engineer, reviews the manufacturer's systems, procedures and inspectors' reports and conducts a final inspection of the factory. If everything is in order, the certificate is issued.

The inspector's work, however, doesn't end with issuance of the production certificate. After it is issued, the inspector initiates a systematic surveillance program. Periodically, he conducts surveys for compliance and to determine if original procedures are still adequate. Whenever any noncompliance is found, the inspector takes appropriate enforcement and corrective action.

Once every three years an interim pro-

duction certification board meeting is conducted. The meeting serves a two-fold purpose—approving or disapproving continuation of the certificate and re-evaluating the FAA inspection program.

It would be an obvious physical impossibility for 83 inspectors to check each item produced by more than 700 prime and subsidiary manufacturers and several hundred supplier manufacturers. Emphasis, therefore, is placed on requiring each manufacturer to maintain an approved quality control system.

Following approval of the quality control system, FAA conducts surveillance inspection. At each prime, subsidiary or parts manufacturer, a manufacturing control area system is set up whereby a plant is divided into areas where similar types of work are going on. An inspector periodically spot-checks operations in these areas and requests appropriate corrective action when deficiencies are noted.

A second method of easing the inspector's workload is through the Technical Standard Order (TSO) system. A manufacturer of aircraft appliances—seat belts, instruments or other components—may be authorized to manufacture articles conforming to a TSO. With this authorization he produces his items marked with the TSO approval, and the inspector again periodically spot-checks to assure that the production articles meet specifications.

The third primary program phase of FAA's inspection procedure is the airworthiness certificate awarded the finished aircraft, signifying that the aircraft and all its parts conform to the type design and are in a condition for safe operation. Each airplane that comes off the production line is individually inspected before the certificate is issued.

FAA's inspectors operate in the plants of 60 prime manufacturers, 12 engine makers, 8 prime propeller factories, 218 parts makers, 210 subsidiary manufacturers and 229 appliance plants operating under the TSO system. Only 27 inspectors are assigned to the Western Region with its many aircraft plants. The Eastern Region is covered by 24, with the Central Region having 14, the Southwest Region 11 and the Southern Region 7. Under certain conditions FAA may designate manufacturing inspection representatives from among a manufacturer's employees. The company officials then perform airworthiness inspections under supervision of the Agency.

As a result of this meticulous checking and manufacturers' adherence to high standards, American aircraft are the safest in the world.

FAA inspectors examine engine drive coupling on Cessna *Skyhook*.

Electrical sub-assembly on Aero *Commander* gets through inspection.

Checking Beechcraft Super H18 on final assembly line.

Company officials and FAA inspector in the wing assembly area of Aero *Commander*.

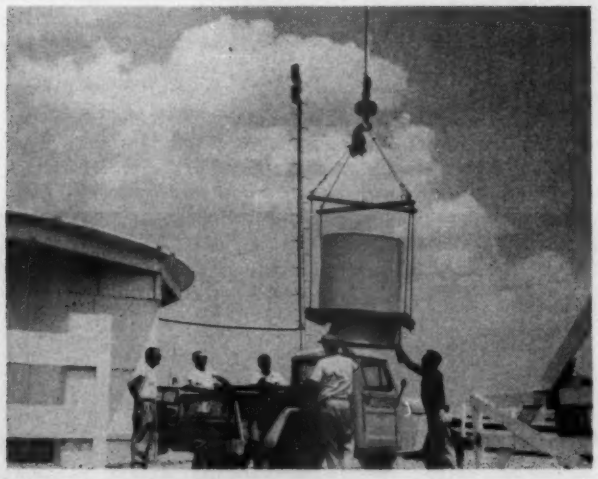
BACK ON THE AIR . . .

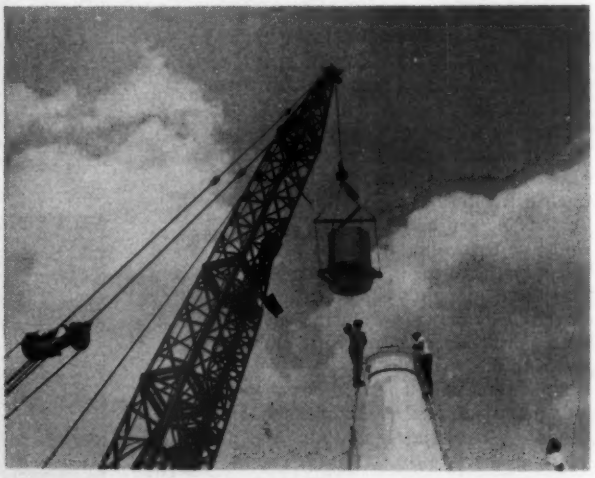
When the Louisville, Ky., TACAN antenna needed replacement recently, FAA electronics technicians went into action with a well-coordinated operation.

After selecting a target date that hopefully would afford VFR weather conditions, a trucking firm was hired to deliver the 600-lb. antenna to the site. A crane with a 60-ft. boom also was engaged to place the antenna atop the 20-ft cone. FAA air traffic control specialists were advised of the arrangements in order to alert pilots. Maintenance schedules were arranged to provide the necessary manpower.

When the antenna change was completed, the electronics technicians made final adjustments and connections. After flight inspection to assure accuracy of the facility, the TACAN was returned to service. Total time off the air—seven hours.

Crane with special sling lifts TACAN replacement antenna off truck *(left)*, then hoists it into position where electronics technicians wait to make connections.





Letters to the Administrator

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. Please keep them brief. No anonymous letters will be used, but names will be withheld on request.

• Link Instruction

I am interested in obtaining information about the FAA requirements for a commercial Link Instructor License. Any information you could give me would be greatly appreciated.

R. R. D.
Beaufort, S. C.

Synthetic instrument trainers, including the Link trainer, may be operated in approved instrument flying schools by the holders of Ground Instructor Certificates with Instrument Ground School ratings, or by Instrument Flight Instructors. A written examination on the fundamentals of instruction and instrument flight procedures is required for such ratings.

Pilot instruction is synthetic flight trainers is now increasing and most airlines and other training facilities have active trainer programs. The Link Division, General Precision, Inc., Binghamton, N. Y., makes available information and brochures on its trainers.

• Instructors and Airspace

Something should be done about improving the training of flight instructors. It seems to me that skills and abilities vary from excellent to hazardous. I also believe that weather instruction should have a more significant place in the private license requirement. I use flight following service on almost every trip I make and am always amazed at the thoroughness of the weather briefings I receive en route.

Another comment I wish to make is one in contradiction to the growing feeling that the airspace is becoming crowded. I am convinced that there is a tremendous amount of airspace still unused and that positive control, except in terminal areas, is unnecessary for some time to come.

Edward I. Creed
Cleveland

Preparations are now being made to provide regular requalification for all flight instructors in order to keep them current, informed and competent on the latest training procedures.

All airspace is by no means congested and steps are being taken to maintain adequate airspace for general aviation VFR operations without the necessity of positive traffic control. General aviation must have the space in which it can move freely and unfettered if it is to continue to grow and realize its potential service to the public.

• Pilot Requirements

I suggest the adoption of simpler, easier standards for private flying. It seems to me that many of the rules and requirements discourage novice pilots. Moreover, the aircraft manufacturing industry and allied lines are denied a growth they otherwise might have. Flying is a tremendous experience. If it were simplified many more people could enjoy it.

Roger Swanson
Kansas City, Mo.

Simpler standards and requirements for private pilots would probably encourage more people to fly. FAA did consider simpler standards for private pilot certificates that would be limited to the short-range use of simple airplanes, but a study showed that small, simple airplanes are disappearing more rapidly than most people realize.

The number of light two-place airplanes has steadily declined each year, until they now represent only 12 percent of the active aircraft in this country. Their average annual utilization, moreover, has fallen to less than half of what it was 10 years ago.

The present private pilot certification requirements have resulted from the complexity of aircraft, equipment and operations now commonplace in personal aviation.

The average private pilot today operates higher performance aircraft under more varied conditions of flight than did commercial pilots 15 years ago. Their own safety and the safety of the public dictate that private pilots be qualified to handle such aircraft and to cope with all flight conditions which can be reasonably anticipated in their flight operations.

In the event small, simple airplanes should again become popular and appear in significant numbers, the FAA will assuredly provide pilot qualifications appropriate to their operation.

• Flight Test Instruments

Kindly advise me if a directional gyro and an artificial horizon may be used in a flight test for private pilot, airplane, single engine. The point is not clear in the flight test guide.

W. E. Peterson
Moline, Ill.

Civil Air Regulations (20.34(d)) specify that the airplane shall be equipped with at least a sensitive altimeter, turn-and-bank indicator and a means for simulating instrument flight conditions. This prescribes the minimum equipment necessary for the required flight procedures. Use of an airplane equipped with a full panel of flight instruments is encouraged whenever possible.

• Simultaneous Transmissions

We understand it is your intention to convert the existing VOR facilities so that the Morse code identification will transmit continuously whether or not the facility is being used for voice communications.

As we view the procedure it has certain advantages—such as encouraging the use of 126.7 mc for communications—but many disadvantages also.

(1) Scheduled weather broadcasts are extremely important and to clutter them up with signals makes enroute information difficult to copy; (2) 126.7 mc is a crowded channel and communication is often difficult; (3) most light aircraft pilots transmit on 122.1 mc and listen to the published VOR frequency; also many light aircraft do not have a full complement of radio equipment and depend on the VOR frequency for navigation and communications.

V. H. Gable
Dallas

Before converting all VORs to the simultaneous code/voice operation, FAA conducted a field test at 20 selected locations.

More than a thousand comments were received from pilots of all levels of experience. About 80 percent favored the idea as a distinct advantage in being able to identify a VOR promptly. The change was made on this basis. VOR facilities are monitored continuously to insure that the code/voice ratio is maintained at the proper level.

• VFR in Control Zones

Please delineate the rights of a pilot or captain of an aircraft in regard to controlled VFR approaches and departures.

Clay Steffee
Kissimmee, Fla.

CAR Part 60, Section 60.31 authorizes VFR flight within control zones when the weather is below basic VFR conditions, provided a clearance is obtained from air traffic control. Operations in accordance with that regulation must remain clear of clouds with at least one mile visibility. No minimum ceiling is specified. The pilot is the sole judge in determining whether the operations should be conducted. Good practice, however, requires that continued flight in near minimum conditions be avoided. The role of air traffic control is limited to issuing the clearance and providing separation from other aircraft.

The "when necessary" language used in CAR 60.17 prohibits low altitude flying except when a departure from the otherwise applicable minimum is necessary. It requires the pilot to do the best he can, consistent with sound flying practice and the aircraft at his disposal, to avoid prolonged low flight.

Something's wrong, but cartoonist Robert Osborn, whose monthly offering appears on the next page, hasn't been able to put his finger on it.

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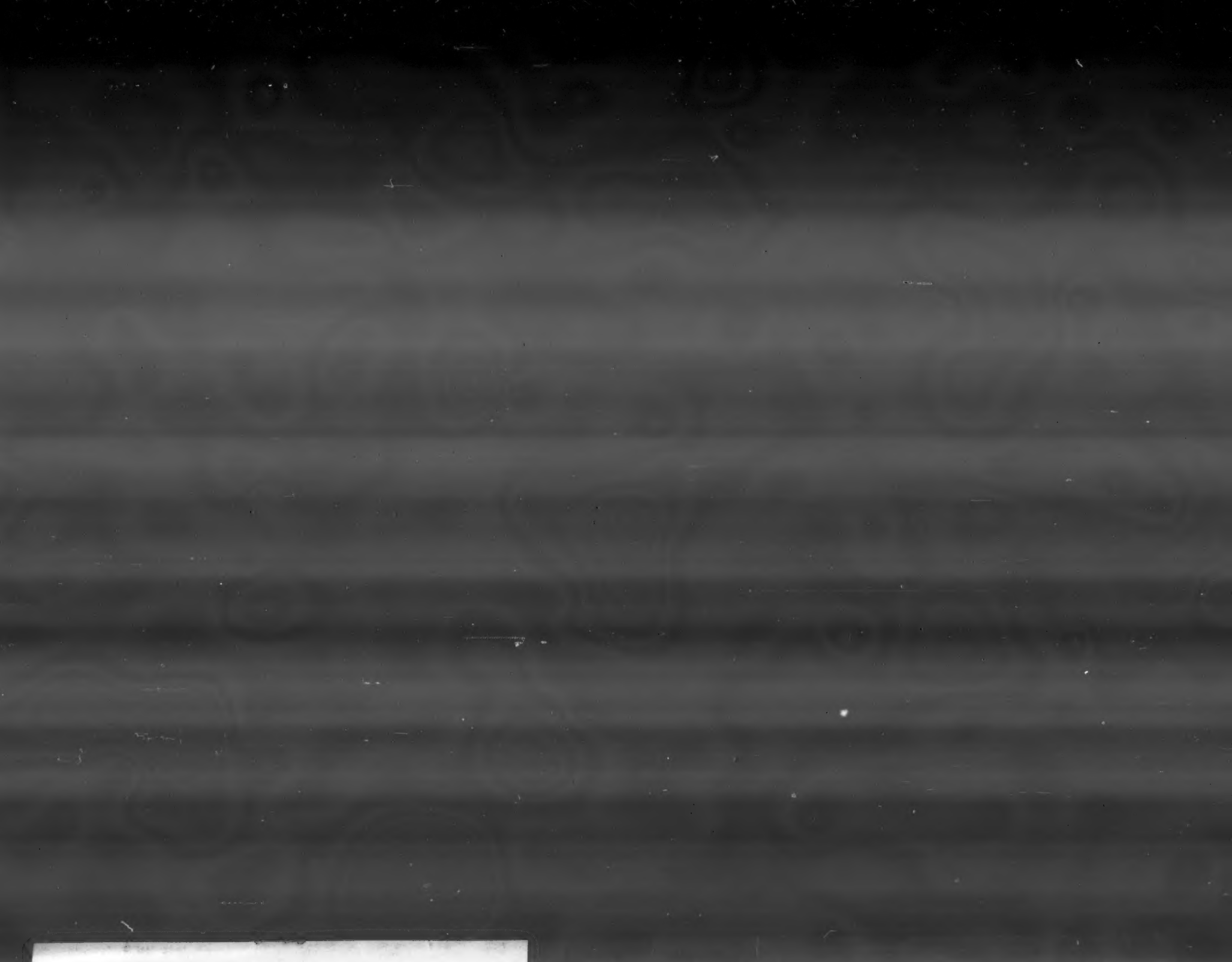
Faulty work contributed to 15% of general aviation accidents